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⑤4 DISPOSABLE TOOTHBRUSH

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No. OF CLAIMS 7

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This invention relates generally to toothbrushes and more particularly to a disposable toothbrush which is specifically designed for extremely low-cost production and distribution and which is accordingly readily disposable after a single use, and to a novel method for producing the disposable toothbrush of the present invention.

For many years dentists and oral hygienists have recommended that teeth should be brushed after every meal. For people who work or travel extensively this is, of course, impossible unless the person carries with him a bulky toothbrush and a tube of toothpaste. There have been many prior art attempts to develop a low-cost disposable toothbrush but all of these prior art attempts have met with failure. These failures have been due primarily to economic and technological reasons which have heretofore prevented the general acceptance of disposable toothbrushes.

In view of this fact it is the primary object of the present invention to provide a disposable toothbrush and a method for making the same by which toothbrushes may be produced which are inexpensive and thereby lend themselves to being disposed of after a single use.

Another object of the present invention is to provide a disposable toothbrush and a container therefor which can be manufactured in a single operation and in such manner that the disposable toothbrush reaches the ultimate consumer in a completely sterile condition.

A further object of the present invention is to provide a unitary disposable toothbrush and a container therefor which is airtight and watertight and therefore permits storage of the toothbrush for indeterminate periods without affecting the sterility of the disposable toothbrush.

Yet another object of the present invention is to provide a disposable toothbrush which is completely portable and of such small bulk that it may be readily distributed in vending machines and which may be carried in an ordinary man's pocket wallet or billfold or in a lady's purse.

These and further objects, features and advantages of the present invention will appear from a reading of the following detailed description of one



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embodiment of the invention which is to be read in conjunction with the accompanying drawings wherein like components in the several views are identified by the same reference numeral.

In the drawings:

Figure 1 is a perspective view of the disposable toothbrush of the present invention, the toothbrush being shown placed upon the finger of the user preparatory to being used to brush the user's teeth;

Figure 2 is a cross-section taken on the line 2-2 of Figure 1;

Figure 3 is a cross-section taken on the line 3-3 of Figure 2;

10 Figure 4 is a perspective view of the disposable toothbrush of the present invention, the disposable toothbrush being shown sealed within an outer envelope;

Figure 5 is a cross-section taken on the line 5-5 of Figure 4;

Figure 6 is a cross-section taken on the line 6-6 of Figure 5;

Figure 7 is a perspective view showing the package of Figure 4 being opened by the user, the view illustrating the outer envelope being peeled away to expose the disposable toothbrush of the present invention;

20 Figure 8 is a top-plan view of a fixture and die for manufacturing the disposable toothbrush and container therefor of the present invention, the fixture and die being shown with the component parts of the disposable toothbrush and container therefor in position preparatory to forming the unit; and

Figure 9 is an end view of the fixture and die illustrated in Figure 8 and showing the component parts of the unit of the present invention prior to heat sealing.

Referring now to the drawings and particularly to Figure 1 the numeral 10 identifies in general the disposable toothbrush of the present invention. In Figure 1 the disposable toothbrush 10 is shown after it has been placed on the finger 11 of the user preparatory to being used to brush the user's teeth. As illustrated in Figure 1 the disposable toothbrush 10 consists 30 essentially of a relatively smooth and flexible sleeve 14 which is closed at one end 12 and which is open at the other end 13 in order to permit the

insertion of the finger 11 within the sleeve 14.

The sleeve 14 as illustrated in Figures 1 and 2 consists of a top wall 15 and a bottom wall 16. The top and bottom walls 15 and 16 are sealed on three sides to form the sleeve 14 which is open at the end 13 to receive the finger 11. The sleeve 14 is preferably made from a flexible vinyl material which can be heat sealed together in a manner and for a purpose to be presently described.

An applicator 17 is attached to the top wall 15 adjacent the sealed end 12. The applicator 17 serves to retain a tooth-cleaning compound or dentrifrice 18 for application to the tooth surfaces and also provides mild and desired stimulation for the gums. It is to be understood that instead of or in addition to the dentrifrice 18 a suitable antiseptic or germicidal agent may be carried by the applicator 17.

The applicator 17 preferably is pre-formed and is bonded to the top wall 15 of the sleeve 14 by a suitable adhesive layer 19. Where the sleeve 14 and applicator 17 are made of compatible thermoplastic materials they may be heat sealed or fused together by high-frequency electrical current, direct application of heat, or other procedures well known in the art. In the preferred embodiment of the invention the adhesive layer 19 consists of a pressure sensitive material which can be pressed on the top wall 15 and which adhers thereto by the mere application of pressure.

The applicator 17 preferably consists of short bristles suitably embedded or bonded in the pressure sensitive layer 19. Preferably the layer 19 is pressure sensitive and is provided with a face of raised looped filaments which project from the backing or base of the layer 19. An example of a suitable material is the nylon plastic strip used for closures of the "Velcro" type.

It is to be understood that the sleeve 14 is preferably made from a synthetic plastic material which is flexible, non-porous, non-toxic and waterproof, such for example, as polyvinyl chloride, natural and synthetic rubbers with or without plasticizers and other agents which are non-toxic and have no objectionable taste or odor characteristics. It is desirable

that the sleeve 14 be at least slightly elastic so as to insure satisfactory fit and retention over a reasonable range of finger sizes.

In order to render the sleeve sterile and not subject to damage by heat, moisture or other factors the sleeve 14 is sealed within the receptacle or envelope 20. The envelope 20 as illustrated in Figures 5, 6 and 7 consists of the outer 22 and inner 21 walls which are sealed around the edges to form a sealed chamber 23 in which the sleeve 14 is encapsulated. As illustrated in Figure 4 the envelope 20 is sealed at one end along the seal line 29 to thereby provide flaps 24 which are an extension of the inner and outer walls 21 and 22. The purpose and function of the flaps 24 will be presently described.

The fabrication and assembly of the disposable toothbrush of the present invention will be described with reference to Figures 8 and 9. As illustrated in Figures 8 and 9 a fixture and die 25 is provided which permits the simultaneous production of a plurality of disposable toothbrushes 10. The fixture and die illustrated in Figure 8 permits the simultaneous manufacture of twelve disposable toothbrushes but it is to be understood that the fixture and die 25 may be in a size and shape to permit the simultaneous manufacture of as many units as desired.

20 The fixture 25 is provided with pins 26 to permit the proper alignment of various component parts of the toothbrush and package of the present invention. The first step in the manufacture of the item of the present invention is to position on the fixture 25 a sheet of material which is to form the outer wall 22 of the envelope 20. The outer edges of the outer wall 22 as illustrated in Figure 8 have been first pre-cut to the desired configuration. Once the outer wall material 22 is positioned on the pins 26 the material which is to form the bottom wall 16 of the sleeve 14 is placed on the fixture 25 in a position overlapping the outer wall 22. As illustrated in Figure 8 the outer edges 27 of the bottom wall 16 are spaced inwardly from the edges 30 28 of the outer wall 22 for a purpose to be presently described. The bottom wall 16 is also positioned by means of the pins 26.

The next step is to position the material which forms the top wall 15 of the sleeve 14. The top wall 15 has exactly the same outer configuration

as the bottom wall 16 and is positioned in registration over the bottom wall 16 by means of the pins 26. It is to be noted that the top wall 15 has affixed thereto the applicator 17. The last step in the assembly operation is to position the inner wall 21 of the envelope 20. The inner wall 21 takes the same configuration as the outer wall 22 and is placed in registration over the other sheets by means of the pins 26.

When the above assembling has been completed, i.e., the outer wall 22 of the envelope 20, the bottom wall 16 of the sleeve 14, the top wall 15 of the sleeve 14 and the inner wall 21 of the envelope 20, the unit is heat sealed together by means of the heat sealing die 29. The heat sealing die 30 seals along the edges 31 to form the individual units 10. The heat sealing is accomplished along the edges 28 of the outer and inner walls 22 and 21 of the envelope 20 but not along the edges 27 of the top and bottom walls 15 and 16 of the sleeve 14. In this manner the inner and outer walls 21 and 22 of the envelope 20 are heat sealed together around their entire perimeter to form the chamber 23. Since the open end 13 of the sleeve 14 is spaced inwardly from the edge 28 of the inner and outer walls 21 and 22 of the envelope 20 the open end 13 of the sleeve 14 is not heat sealed together during the heat sealing operation. The sleeve 14, however, is encapsulated within the chamber 23 formed by the envelope 20, the chamber 23 being airtight and impervious to the entrance of any liquid or gases. Since one end of the envelope 20 is heat sealed along the edge 29 the ends of the inner and outer walls 21 and 22 of the envelope 20 are not heat sealed together thereby forming the flaps 24.

When it is desired to use the disposable toothbrush of the present invention the inner and outer walls 21 and 22 of the envelope 20 are peeled away from the top and bottom walls 15 and 16 of the sleeve 14. This is accomplished by grasping the flaps 24 between the fingers as illustrated in Figure 7 and simply pulling the inner wall 21 and the outer wall 22 away thereby exposing the sleeve 14. The finger 11 is then inserted in the open end 13 of the sleeve 14 and the toothbrush of the present invention is ready

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for use. Once the toothbrush has been used it is disposed of by simply removing it from the finger.

It is to be understood that although a preferred embodiment of the invention has been described and illustrated that such description was given for purposes of describing the invention and is not meant as a limitation, the intention being to cover all changes and modifications which do not constitute departures from the spirit and scope of the invention.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A disposable toothbrush and envelope therefore to maintain said toothbrush in a sterile condition free from contamination by gases or liquids prior to use, said toothbrush and envelope comprising a flexible sleeve sealed at one end and open at the other end and adapted to be placed on the finger of a user to function as a toothbrush, an applicator on one face of said sleeve, first and second outer layers of flexible impervious material, said first and second layers being located on opposite sides of said sleeve, and the edges of said outer layers being sealed to the edges of said sleeve to form an envelope for said sleeve.
2. A device in accordance with claim 1 wherein said outer layers extend beyond the open end of said sleeve whereby when said layers are joined together along their edges to form an envelope said sleeve is encapsulated therein with the open end unsealed.
3. A device in accordance with claim 2 wherein said outer layers are sealed together inwardly from the end thereof adjacent the open end of said sleeve but outwardly from the end of said sleeve to form pull tabs for pealing said outer layers forming said envelope away from said sleeve.
4. A device in accordance with claim 3 wherein said toothbrush and envelope are simultaneously formed from four sheets of material positioned in overlapping relationship and sealed along the edges thereof.
5. A device in accordance with claim 4 wherein said applicator has a dentifrice applied thereto.
6. A disposable toothbrush and envelope therefor to maintain said toothbrush in a sterile condition free from contamination by gases or liquids prior to use, said toothbrush and envelope comprising four sheets of flexible material arranged in overlapping relationship, said first and fourth sheets being impervious to liquids and gases and forming said envelope and said second and third sheets forming said sleeve, one edge of said second sheet and a corresponding edge of said third sheet being spaced inwardly from the edges of said first and fourth sheets to

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to form an open end for said sleeve, an applicator on one face of said sleeve, and the common edges of said sheets being sealed together to encapsulate said sleeve within said envelope.

7. A device in accordance with claim 6 wherein said first and fourth sheets adjacent the open end of said sleeve are sealed together inwardly from the edges thereof to form pull tabs.



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FIG. 8.

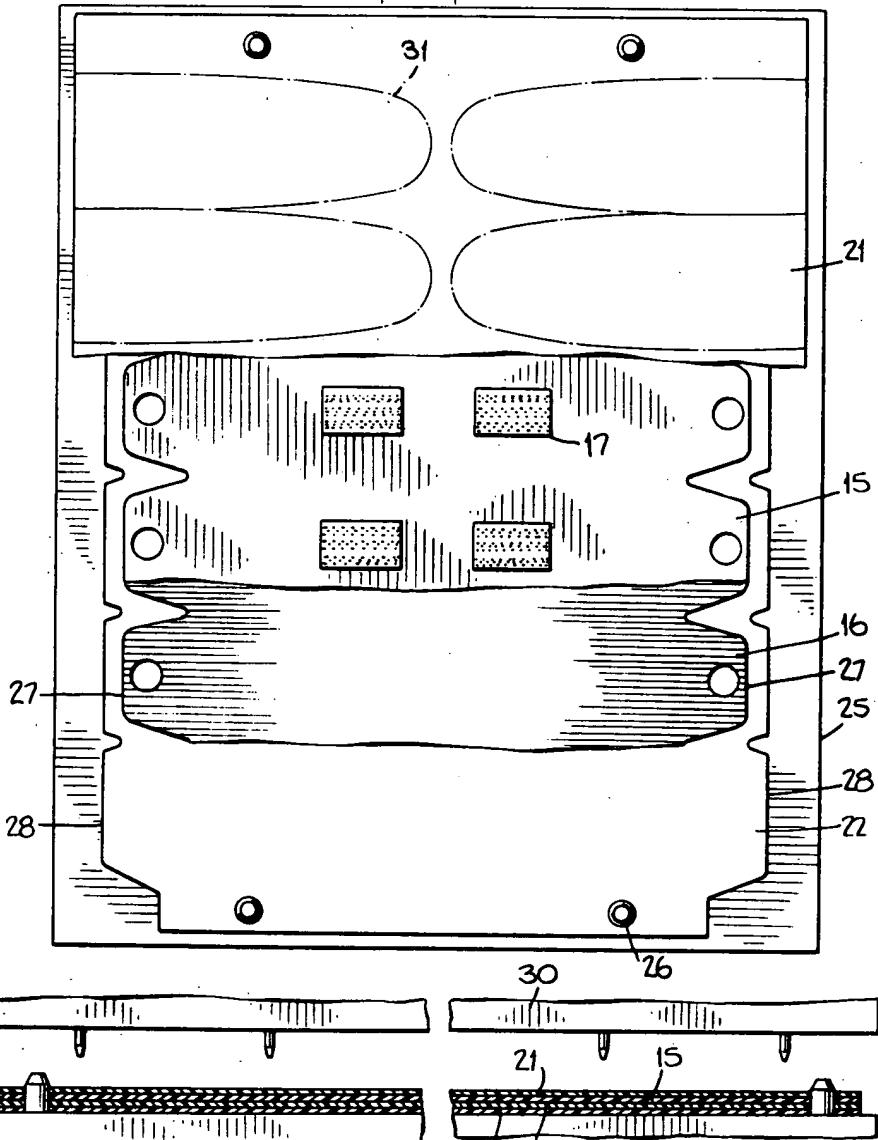
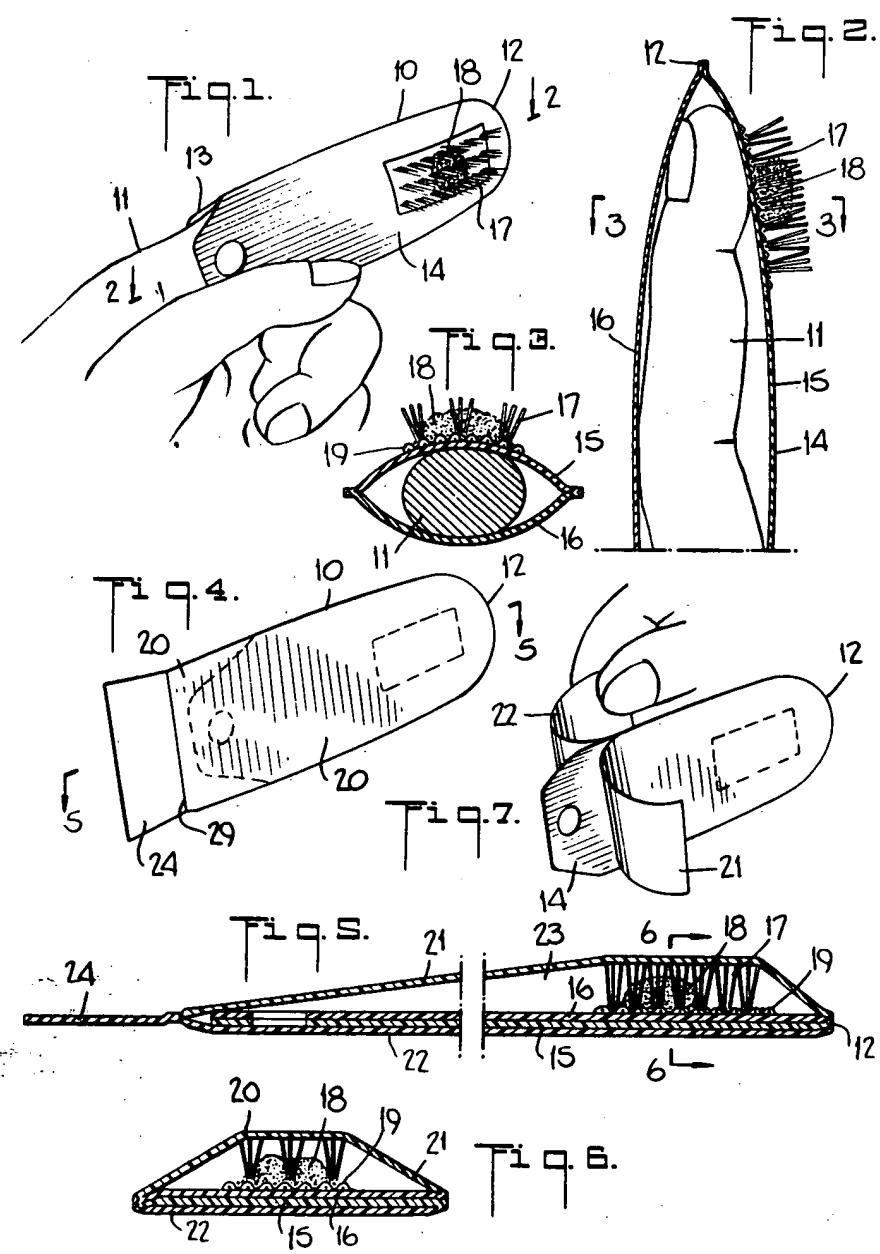


FIG. 9.

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